

Mutagenic Evaluation of Compound FDA 71-74
4/15/75

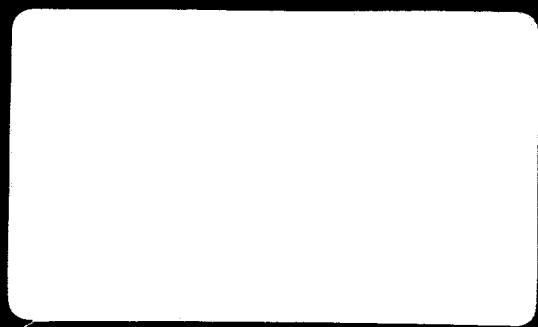
(Sodium Aluminum Sulfate)

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5516 Nicholson Lane
Kensington, Maryland
20795

LBI PROJECT # 2468

MUTAGENIC EVALUATION OF

COMPOUND 007784283

SODIUM ALUMINUM SULFATE

(71-74)

SUBMITTED TO

FOOD & DRUG ADMINISTRATION
DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
ROCKVILLE, MARYLAND

SUBMITTED BY

LITTON BIONETICS, INC.
5516 NICHOLSON LANE
KENSINGTON, MARYLAND

APRIL 15, 1975



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EVALUATION SUMMARY

Compound 007784283, Sodium Aluminum Sulfate, did not exhibit genetic activity in any of the in vitro microbial assays employed in this evaluation.



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DATE: 04/15/75

SPONSOR: Food and Drug Administration, Contract Number 223-74-2104

SUBJECT: Evaluation of Test Compound 007784283, Sodium Aluminum Sulfate

I. OBJECTIVE

The objective of this study was to evaluate the test compound for genetic activity in microbial assays with and without the addition of mammalian metabolic activation preparations.

II. MATERIALS

A. Test Compound

1. Date Received: August, 1974
2. Description: Grey-white, fine powder

B. Indicator Microorganisms

The following strains of indicator microorganisms were used in the evaluation:

Yeast Strain: Saccharomyces cerevisiae, strain D4

Bacteria Strains: Salmonella typhimurium, strains: TA-1535
TA-1537
TA-1538

C. Reaction Mixture

The following reaction mixture was employed in the activation tests:

<u>Component</u>	<u>Final Concentration/ml</u>
1. TPN (sodium salt)	6 μ M
2. Isocitric acid	49 μ M
3. Tris buffer, pH 7.4	28 μ M
4. $MgCl_2$	1.7 μ M
5. Tissue homogenate fraction	72 mg



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D. Tissue Homogenates and Supernatant

The tissue homogenates and 9,000 x g supernatants were prepared from tissues of the following mammalian species: Mouse-ICR random bred adult males; rat-Sprague-Dawley adult males; and primate-Macaca mulatta adult males.

E. Positive Control Compounds

Table 1 lists chemicals for positive controls in the direct and activation assays.

TABLE 1

POSITIVE CONTROLS USED IN DIRECT AND ACTIVATION ASSAYS

<u>Assay</u>	<u>Chemical^a</u>	<u>Solvent</u>	<u>Probable Mutagenic Specificity</u>
Non-activation	Ethylmethane sulfonate	Water or saline	BPS
	2-Nitrofluorene	Dimethylsulfoxide ^c	FS
	Quinacrine mustard	Water or saline	FS
Activation	Dimethylnitrosamine	Water or saline	BPS
	2-Acetylaminofluorene	Dimethylsulfoxide ^c	FS

^a Concentrations given in the Results Section

^b BPS = base-pair substitution; FS = frameshift

^c Previously shown to be non-mutagenic

III. METHODS

A. Toxicity

The solubility, toxicity and doses for all chemicals were determined prior to screening.

Each chemical was tested for survival against the specific indicator strains over a range of doses to determine the 50% survival dose.

Bacteria were tested in phosphate buffer, pH 7.4, for one hour at 37°C on a shaker. Yeasts were tested in phosphate buffer, pH 7.4, for four hours at 30°C on a shaker. The 50% survival curve and the 1/4 and 1/2 50% doses calculated.

If no toxicity was obtained for a chemical with a given strain, then a maximum dose of 5% (w/v) was used against the strain.

Unless otherwise specified, the doses calculated for the tests in buffer were applied to the activation tests. The solubility of the test chemical under treatment conditions is stated in the Results Section.



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B. Plate Tests

In the nonactivation procedure, approximately 10^9 cells of a log-phase culture of the bacterial indicator strains were spread over the surface of a minimal plate, and a measured amount of the test chemical was placed in the center of the test plate. In activation tests, the test chemical was added to the cells, and an aliquot of the mixture was spread on the surface of the test plate. The reaction mixture (0.1 ml) plus tissue extract was then spotted on the surface of the plate. Positive and solvent controls were included. All plates were incubated at 37°C for four days and then scored. Each compound (test, positive control and solvent control) was done in duplicate. Concentrations of the positive control compounds are listed in the Results Section.

C. Suspension Tests

1. Non activation

Log-phase bacteria and stationary-phase yeast cultures of the indicator organisms were grown in complete broth, washed and resuspended in 0.9% saline to densities of 1×10^9 cells/ml and 5×10^7 cells/ml, respectively. This constituted the working stock for tests of a group of test chemicals and their respective controls. Tests were conducted in plastic tissue culture plates. Cells plus appropriate volume(s) of the test chemical were added to the wells to give a final volume of 1.5 ml. The solvent replaced the test chemical in the negative controls. Treatment was at 30°C for four hours for yeast tests and at 37°C for one hour for bacterial tests. All flasks were shaken during treatment. Following treatment, the plates were set on ice. Aliquots of cells were removed, diluted in sterile saline (4°C) and plated on the appropriate complete media. Undiluted samples from flasks containing the bacteria were plated on minimal selective medium in reversion experiments. Samples from a 10^{-1} dilution of treated cells were plated on the selected media for enumeration of gene conversion with strain D4. Bacterial plates were scored after incubation for 48 hours at 37°C. The yeast plates were incubated at 30°C for 3-5 days before scoring.

2. Activation

Bacteria and yeast cells were grown and prepared as described in the non activation tests. Measured amounts of the test and control chemicals plus 0.25 ml of the stock-cell suspension were added to wells of the Linbro plate containing the appropriate tissue fraction and reaction mixture. All flasks (bacteria and yeast) were incubated at 37°C in an oxygen atmosphere with shaking. The treatment times as well as the dilutions, plating procedures and scoring of the plates were the same as described for non activation tests.



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D. Preparation of Tissue Homogenates and 9,000 x g Cell Fractions

Male animals (sufficient to provide the necessary quantities tissues) were killed by cranial blow, decapitated and bled. Organs were immediately dissected from the animal using aseptic techniques and placed in ice-cold 0.25 M sucrose buffered with Tris at pH of 7.4. Upon collection of the desired quantity of organs, they were washed twice with fresh buffered sucrose and completely homogenized with a motor-driven homogenizing unit at 4°C. The whole organ homogenate obtained from this step was divided into two samples. One sample was frozen at -80°C and the other was centrifuged for 20 minutes at 9,000 x g in a refrigerated centrifuge. The supernatant from the centrifuged sample was retained and frozen at -80°C. These two frozen samples were used for the activation studies.

E. Data Recording and Reporting

Following the specified incubation periods all population plates were scored by an automatic colony counter and the results from each plate of a set were recorded, in ink, on data processing forms. All minimal or other types of selective media plates were hand scored and the results recorded along with the respective population data. Other relevant experimental data were recorded on experimental definition forms. For bacteria strains the number of colonies recorded from either the population or selective plates represents that number in 1 ml of test suspension plated. The numbers recorded for the yeast strain D4 represent the number in 0.5 ml of test suspension plated. Data was then processed and printed from a computer program.



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SOLUBILITY PROPERTIES OF THE TEST COMPOUND

1. NAME OR DESCRIPTION OF TEST COMPOUND:

007784283 Sodium Aluminum Sulfate

2. TEST SOLVENT AND DESCRIPTION OF SOLUBILITY:

Suspension in 10% Saline
Soluble at treatment concentrations.

3. OTHER COMMENTS:

Fine Grey Powder



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TOXICITY AND DOSAGE DETERMINATIONS

COMPOUND 007784283

TEST DATE: January 7, 1975

Range of concentrations of the test compound used to determine the 50% survival level

<u>Dose Number</u>	<u>% Concentration</u>
1	10.0
2	1.0
3	0.1
4	0.01
5	0.001

Concentrations of the test chemical required for mutagenicity tests

<u>Dose</u>	<u>% Concentration</u>	
	<u>Bacteria</u>	<u>Yeast</u>
1/4 50% survival	0.0025	0.05
1/2 50% survival	0.0050	0.10
50% survival	0.0100	0.20
Plate Test	0.0050	--



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C. Summary of Test Results

Plate Tests

1. Name or code designation of the test compound: 00784283

2. Test date: January 31, 1975

3. Concentration of the test compound: 0.005%

<u>Test</u>	<u>Species</u>	<u>Tissue</u>	TA-1535	TA-1537	TA-1538		
<u>Non-activation</u>							
Solvent Control	--	--	6	1	4	3	6
Positive Control ^a	--	--	>10 ⁴	>10 ⁴	85	74	34
Test Compound	--	--	1	6	7	3	9
<u>Activation</u>							
Negative Control	--	--	11	12	1	2	12
Solvent Control	--	--	4	9	3	1	6
Reaction Mixture Control	--	--					5
Positive Control ^b	Mouse	Liver	>500	>500	>100	85	>200
Positive Control		Lung	9	5	8	11	15
Positive Control		Testes	3	4	7	8	10
Positive Control	Rat	Liver	>100	>100	28	24	63
Positive Control		Lung	9	4	6	7	12
Positive Control		Testes	4	3	8	6	9
Positive Control	Monkey	Liver	>100	>100	38	25	31
Positive Control		Lung	10	5	6	7	12
Positive Control		Testes	4	5	6	6	10
Test Compound	Mouse	Liver	8	6	5	3	9
Test Compound		Lung	9	8	9	3	7
Test Compound		Testes	6	9	9	8	4
Test Compound	Rat	Liver	9	5	4	1	9
Test Compound		Lung	7	8	8	4	7
Test Compound		Testes	6	10	10	7	6
Test Compound	Monkey	Liver	9	6	5	3	8
Test Compound		Lung	9	7	7	3	10
Test Compound		Testes	9	8	8	7	7

^a TA-1535 EMs 10 µl/plate
 TA-1537 QM 20 µg/plate
 TA-1538 NF 100 µg/plate

^b TA-1535 DMNA 50 µm/plate
 TA-1537 AAF 100 µg/plate
 TA-1538 AAF 100 µg/plate



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DATA TABLE TERMS AND ABBREVIATIONS

<u>ABBREVIATION OR TERM</u>	<u>DEFINITION OR EXPLANATION</u>
COMPOUND	Client designated compound number appears in this column.
TEST CODES	<p>NAN = Non Activation: Solvent Control NAP = Non Activation: Positive Control NA1 = Non Activation: Test Compound Dose 1 NA2, etc. = Reflects the other dose level(s)</p> <p>A+C = Negative Chemical Control A-C = Activation: Solvent Control ACP = Activation: Positive Control ACT = Activation: Test Compound</p> <p>LI = Liver Tissue Activation Fraction LU = Lung Tissue Activation Fraction KI = Kidney Tissue Activation Fraction TE = Testes Tissue Activation Fraction 1,2, etc. = Dose Levels</p>
CONCENTRATION	All test compound dose levels are expressed as a whole number followed by an exponent (negative) identified by the appropriate units. Example: 0025-2PCT = 0.25 percent concentration
POPU	Total number of viable cells in the plating sample raised to some exponent printed directly below the abbreviation (i.e., EP + 6 = $\times 10^6$).
MUT 1	Total number of mutants or convertants obtained from the sample plated raised to some exponent printed directly below the abbreviation (i.e., EP + 0 = $\times 10^0$). For strain D4, MUT 1 represents the number of ADE+ convertants.
MUT 2	Only used for strain D4 and represents the number of TRY+ convertants in the plated sample.
FREQ 1	The calculated mutation or gene conversion frequency times the negative exponent written directly below. For strain D4, FREQ 1 represents the ADE+ value.
FREQ 2	Only used for strain D4 and represents the TRY+ conversion frequency.
CONTAM	Presence of contamination on any plates.



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DATA TABLE TERMS AND ABBREVIATIONS (continued)

ABBREVIATION OR TERM	DEFINITION OR EXPLANATION
AAF	2-Acetylaminofluorene
DMSO	Dimethylsulfoxide
DMN	Dimethylnitrosamine
EMS	Ethyl Methanesulfonate
QM	Quinacrine Mustard
NF	Nitrofluorene
SPECIES	Animal Strains
SPRDW	Sprague Dawley Rats
ICRFLO	Flow ICR Random Bred Mice
RHESUS	Rhesus Monkey (<u>Macaca mulatta</u>)
MIXEDB	Dog, Mixed Breed
NEWZEA	New Zealand White Rabbit



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LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 04/15/75

SPECIES COMPOUND 007784283

TEST	ORG	TA1535 HIS EX-8	TA1537 HIS EX-8	TA1538 HIS EX-8	0000D4 ADE EX-5	0000D4 TRY EX-5
NAN		1.61	12.08	5.80	2.21	3.14
NAP		243.05	2686.46	469.44	66.33	77.39
NA1		2.50	12.04	11.95	1.95	2.88
NA2		2.29	12.70	9.59	2.27	3.17

LITTON BIOMETRICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 04/15/75

SPECIES ICREFNO COMPOUND 007784283

TEST	ORG	TA1535 HIS FX-8	TA1537 HIS EX-8	TA1538 HIS EX-8	0000D4 ADE FX-5	0000D4 TRY FX-5
ACT	A+C	0.93	3.59	4.92	6.30	12.91
ACT	A-C	1.04	3.21	5.77	6.38	13.81
ACT	PLI	128.68	6.71	24.04	9.48	29.12
ACT	PLU	1.00	2.19	7.37	6.67	16.81
ACT	PTF	1.63	2.90	7.02	4.73	17.40
ACT	L11	2.46	1.98	7.55	4.65	15.50
ACT	L12	1.22	2.29	17.11	8.06	23.52
ACT	L01	1.34	2.00	8.93	8.36	17.26
ACT	L02	1.37	1.47	13.97	7.79	16.62
ACT	TE1	2.73	2.24	8.11	5.96	21.98
ACT	TE2	2.56	3.00	10.04	6.10	18.84

LITTON BIOMETRICS MUTAGENIC ACTIVITY SYSTEM
REPORT FXR34

COMPOUND FREQUENCY SUMMARY REPORT 04/15/75

SPECIES SPRDAW COMPOUND 007784283

TEST	ORG	TA1535 HIS FX-8	TA1538 HIS FX-8	TA-1537 HIS EX-8	0000D4 ADE FX-5	0000D4 TRY FX-5
------	-----	-----------------------	-----------------------	------------------------	-----------------------	-----------------------

ACT	A+C	2.22	7.88	4.08	5.52	14.73
ACT	A-C	1.45	6.66	2.92	7.34	18.04
ACT	PL I	184.24	27.00	11.43	9.87	21.94
ACT	PL II	2.45	10.52	4.70	6.34	16.64
ACT	PTF	2.83	8.02	3.66	1.63	2.90
ACT	LT1	1.72	9.64	3.43	3.77	6.92
ACT	LT2	1.35	11.42	3.51	8.18	17.44
ACT	LU1	1.42	8.58	3.11	3.60	13.75
ACT	LU2	2.35	10.41	3.45	3.55	15.14
ACT	TE1	1.44	5.09	3.12	5.79	16.94
ACT	TE2	1.81	9.12	3.04	4.67	19.46

LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 04/15/75

SPECIES RHESIUS COMPOUND 007784283

TEST	ORG	TA1535 HIS EX-8	TA1537 HIS EX-8	TA1538 HIS EX-8	TA1538 HIS EX-8	000004 ADE FX-5	000004 TRY EX-5
ACT	A+C	6.27	11.64	8.12		3.21	49.15
ACT	A-C	3.13	0.52	6.60	4.04	5.18	45.95
ACT	PL I	52.59	9.57	24.07		6.74	79.77
ACT	PLII	5.62	5.13	10.43		1.01	68.34
ACT	PTE	6.42	8.91	6.49		3.76	42.38
ACT	L11	3.29	1.00	11.86		3.26	63.41
ACT	L12	3.93	4.58	11.05		4.58	61.99
ACT	L01	4.45	2.68	18.81	3.59	2.63	41.41
ACT	L02	4.02	8.70	12.77		6.63	62.35
ACT	TF1	5.41	1.72	13.68		4.40	57.23
ACT	TF2	3.02	2.92	7.17		5.13	57.44

V. INTERPRETATION OF RESULTS AND CONCLUSIONS

Compound 007784283, Sodium Aluminum Sulfate, was evaluated for genetic activity in a series of in vitro microbial assays with and without metabolic activation. The following results were obtained:

A. Salmonella typhimurium

1. Plate tests

At a concentration of 0.005%, 007734283, was not mutagenic for any of the bacteria indicator organisms in either direct or activation plate assays.

2. Nonactivation suspension tests

The results of these tests were negative.

3. Activation suspension tests

The results of these tests were negative. TA-1537 with rat tissues was run as a separate experiment and entered by hand. The positive controls for TA-1537 and TA-1538 were lower than normal.

B. Saccharomyces cerevisiae

1. Nonactivation suspension tests

The results of these tests were negative.

2. Activation suspension tests

The results of these tests were negative. A higher than normal spontaneous background at the TRY locus was observed in these tests.

C. Conclusions

Compound 007784283, Sodium Aluminum Sulfate, did not exhibit genetic activity in any of the assays employed in this evaluation.

Submitted by:


David Brusick, Ph.D.
Director of Genetics



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APPENDIX
Tabulation of Data



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REPORT FXR33 LITTON BIOMETRICS MILITARY ACTIVITY SYSTEM
COMPONENT SUMMARY BACKUP DETAIL

EXPERIMENT 500902 DEFECTOR TA1535 SPECIES			PROJECT 07468 DATE - 04/15/75
ORG	TEST ID	CONCENTRATION	PNUMLIMIT
NAM	SALINE	1308 0021	ER+6 FP+0 1.61
NAP	FMS 0.002%	1057 2560	243.05
007784283	NA1	0005-3 PCT.	0799 0020 2.50
007784283	NA2	0075-4 PCT.	0787 0018 2.29

REPORT FXR33 LITTON BIOMEDICS MUTAGENIC ACTIVITY SYSTEM
COMPONENT SUMMARY BACKUP DETAIL

EXPERIMENT 502302 CONTRACT 22374-2104
PROJECT 02468 DATE - 04/15/75
SPECIERS TA1537

TEST	NRG	CONCENTRATION	P0P1	MUT1	FRFO1	CONTAM
NAN	SALINE	0.240	0029	12.08	FP-R	0
NAP	0M 1.0 MG/ML	0096	2579	2686.46	0	0
007784283	NA1	0005-3 PCT.	0191	0023	12.04	0
007784283	NA2	0025-4 PCT.	0252	0032	12.70	0

REPORT FXR33 LITTON RADIANTICS MILITAGNIC ACTIVITY SYSTEM
COMPONENT SUMMARY RACKUP DETAIL

CONTRACT 22374-2104			PROJECT 07468		
EXPERIMENT 502301			DATE - 04/15/75		
CONTRACT	DEFFECTOR	SPFCIES	PROJ	MULT	FRFOL
502301	T A 1538		0414	FP+6	FP-R
NAME	CONCENTRATION		0024		CNTAM
NAP	DN50				0
007784283	NE 125 116-ML	0288	1352		0
NA1	0005-3 PCT.	0318	0038		0
007784283	0025-4 PCT.	0344	0033	9.59	0

REPORT FXR33 LITTON RIONTICS MILITAGFNIC ACTIVITY SYSTEM
 COMPOUND SUMMARY BACKUP DETAILED

CONTRACT 22374-2104

EXPERIMENT 504801 DETECTOR 000004

SPECIES			DATE - 04/15/75		
ORG	ID	CONCENTRATION	PnPi	MnT1	MnT2
COMPONENT	TEST		FP+4	FP+1	FP+1
NAN	SALINE	1084	0024	0034	2.21
NAP	FMS 1.0 %	1004	0666	0777	66.33
007784283	NA1	0001-1 PCT.	1076	0021	0031
007784283	NA2	0005-2 PCT.	1011	0023	0032

SPECIES			DATE - 04/15/75		
ORG	ID	CONCENTRATION	PnPi	MnT1	MnT2
COMPONENT	TEST		FP+4	FP+1	FP+1
NAN	SALINE	1084	0024	0034	2.21
NAP	FMS 1.0 %	1004	0666	0777	66.33
007784283	NA1	0001-1 PCT.	1076	0021	0031
007784283	NA2	0005-2 PCT.	1011	0023	0032

REPORT FXR33 LITTON RIONETICS MAGNETIC ACTIVITY SYSTEM
COMPONENT SUMMARY BACKUP DETAIL

CONTRACT 22374-2104			PROJECT 07468		
EXPERIMENT 434601			DATE - 04/15/75		
COMPOUND	TEST ID	DETECTOR TA1535	SPFC1FS	ICRFLN	
ORG	CONCENTRATION	PNP11	MULTI	F2F01	CONTAM
A+C	DMM 50 UM/ML	1286	EP+0	EP-R	0
A-C	SALINE	1248	0013	1.04	?
ACP	L1	DMM 50 UM/ML	1210	1557	128.68
ACP	L11	DMM 50 UM/ML	1095	0011	1.00
ACP	TE	DMM 50 UM/ML	1163	0019	1.63
007784283	ACT	L11	0005-3 PCT.	0974	0024
007784283	ACT	L12	0025-4 PCT.	1062	0013
007784283	ACT	L11	0005-3 PCT.	1192	0016
007784283	ACT	L112	0025-4 PCT.	1164	0016
007784283	ACT	TF1	0005-3 PCT.	0953	0026
007784283	ACT	TF2	0025-4 PCT.	1211	0031
					2.56

REPORT FXR33 LITTON RIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPONENT SUMMARY BACKUP DETAIL

COMPONENT	TEST ID	ORG	CONCENTRATION	PNP1	MUT1	FRF01	CONTAM
A+C	AAF 800 ug/ml	1783	0064	EP+6	EP+0	FP-8	
A-C	DMSO	1590	0051			3.59	0
A,C,P	AAF 800 ug/ml	1983	0133			3.21	0
ACP	LII AAF 800 ug/ml	1460	0032			6.71	3
ACP	TE AAF 800 ug/ml	1619	0047			2.19	2
007784283	ACT LII 0005-3 PCT.	1765	0035			2.90	2
007784283	ACT LII 0025-4 PCT.	1747	0040			1.98	2
007784283	ACT LII 0005-3 PCT.	1547	0031			2.29	2
007784283	ACT LII 0025-4 PCT.	1356	0020			2.00	2
007784283	ACT TF1 0005-3 PCT.	1744	0039			1.47	2
007784283	ACT TE2 0025-4 PCT.	1631	0049			2.24	2
						3.00	2

REPORT FXR33 EDITION RINNFTICS MILITAGNIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104

EXPERIMENT 435001 DEFECTOR TA1538 SPECIES ICREFLN PROJECT 02468

COMPOUND	TEST ID	ORG	CONCENTRATION	PROMT	MULT	FR01	CONTAM
A+C	AAF 800 UG/ML	1363	0067	FP+K	FP+O	4.92	0
A-C	DMSO	1820	0105			5.77	0
ACP	L.I. AAF 800 UG/ML	1252	0301			24.04	3
ACP	L.O. AAF 800 UG/ML	1262	0093			7.37	2
ACP	TE AAF 800 UG/ML	1140	0080			7.02	2
007784283	ACT L.I.L 0005-3 PCT.	1059	0080			7.55	2
007784283	ACT L.I.T 0025-4 PCT.	0672	0115			17.11	2
007784283	ACT L.I.U 0005-3 PCT.	1019	0091			8.93	0
007784283	ACT L.I.U 0025-4 PCT.	0630	0088			13.97	2
007784283	ACT TE1 0005-3 PCT.	1405	0114			8.11	3
007784283	ACT TF2 0025-4 PCT.	1215	0122			10.04	2

REPORT FYR33 LITTON RIONETICS MILAGENIC ACTIVITY SYSTEM
COMPONENT SUMMARY BACKUP DETAIL

CONTRACT 22374-2104			SPECIES ICRLN			PROJECT 02468		
EXPERIMENT	NUMBER	DEFFECTIVE NUMBER	PNP1	MIL1	MIL2	FREO1	FREO2	DATE - 04/15/75
COMPONENT	TEST ID	CONCENTRATION	EP+4	EP+1	EP+1	FP-5	FP-5	CONTAM
A+C	DMM 90 UM/ML	0968	0061	0125	6.30	12.91	0	
A-C	SALT INF	1050	0067	0145	6.38	13.81	0	
ACP	L1 DMM 90 UM/ML	0728	0069	0212	9.48	29.12	2	
ACP	L1 DMM 90 UM/ML	0809	0054	0136	6.67	16.81	2	
ACP	TE DMM 90 UM/ML	0931	0044	0162	4.73	17.40	6	
007784283	ACT L11 0001-1 PCT.	0774	0036	0120	4.65	15.50	0	
007784283	ACT L12 0005-2 PCT.	0608	0049	0143	8.06	23.52	4	
007784283	ACT L01 0001-1 PCT.	0562	0047	0097	8.36	17.26	0	
007784283	ACT L12 0005-2 PCT.	0770	0060	0128	7.79	16.62	0	
007784283	ACT TF1 0001-1 PCT.	0587	0035	0129	5.96	21.98	4	
007784283	ACT TF2 0005-2 PCT.	0934	0057	0176	6.10	18.84	0	

REPORT FXR33 LITTON RIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPONENT SUMMARY BACKUP DETAIL

CONTRACT 2374-2104				PROJECT 02468			
EXPERIMENT 500201				DATE - 04/15/75			
ORG	ID	CONCENTRATION	SPECIES SPRD/W	PROJ	MULT	PER01	CONTAM
A+C	DMN 50 UM/ML	0450	0010	FP+6	FP+0	FP-R	0
A-C	SAL. INF	0826	0012				?
ACP	L.I DMN 50 UM/ML	0628	1157			1.45	?
ACP	L.I DMN 50 UM/ML	0653	0016			1.84.24	0
ACP	TF DMN 50 UM/ML	0566	0016			2.45	0
007784283	ACT L.II 0005-3 PCT.	0580	0010			2.83	?
007784283	ACT L.II 0025-4 PCT.	0371	0005			1.35	2
007784283	ACT L.II 0005-3 PCT.	0703	0010			1.42	0
007784283	ACT L.II 0025-4 PCT.	0468	0011			2.35	?
007784283	ACT TEI 0005-3 PCT.	0557	0008			1.44	2
007784283	ACT TF2 0025-4 PCT.	0497	0009			1.81	?

RFP/PIRT FXR33 LITTON RIONETICS MILITARY ACTIVITY SYSTEM
COMPONENT SUMMARY BACKUP DETAIL

EXPERIMENT 505006			CONTRACT 22374-2104			DEFECTOR TA1537			SPFCIFS SPRDAM			PROJECT 02468 DATE - 04/15/75	
COMPONENT	TEST	ID	ORG	CONCENTRATION	PCT.	PPPI	MUT1	PPPI	MUT1	PPPI	MUT1	FREQU	CONTAM
007784283	ACT	L11	0005-3	PCT.	1927	0066				3.43		0	
007784283	ACT	L12	0025-4	PCT.	1909	0067				3.51		0	
007784283	ACT	L11	0005-3	PCT.	1929	0060				3.11		0	
007784283	ACT	L12	0025-4	PCT.	2491	0086				3.45		0	
007784283	ACT	TF1	0005-3	PCT.	2017	0063				3.12		0	
007784283	ACT	TF2	0025-4	PCT.	2568	0078				3.04		0	
A-C		DMSO			2053	0060				2.92		0	
A+C		AAF 800 UG/ML			1983	0081				4.08		0	
ACP LI		AAF 800 UG/ML			1977	0226				11.43		0	
ACP LU		AAF 800 UG/ML			2002	0094				4.70		0	
ACP TE		AAF 800 UG/ML			2132	0078				3.66		0	

REPORT FXR33 LITTON RIMNETICS MUTAGENIC ACTIVITY SYSTEM
COMPOND SUMMARY BACKUP DFTAIL

EXPERIMENT	CONTRACT	TEST	IN	CONCENTRATION	SPECIES	SPRDAM	PROJECT	DATE
500301	27374-2104	DETECTOR	TA1538		PNPPI	MUT1	FR001	02468
		ORG	TD		FP+G	FP+0	FP-R	04/15/75
A+C		AAF	800 UG/ML	0964	0076			0
A-C		DMSO		1276	0085			1
ACP	L1	AAF	800 UG/ML	1052	0284			0
ACP	L11	AAF	800 UG/ML	1017	0107			0
ACP	TF	AAF	800 UG/ML	1347	0108			?
007784283	ACT	L11	0005-3 PCT.	0674	0065			0
007784283	ACT	L12	0025-4 PCT.	0832	0095			?
007784283	ACT	L11	0005-3 PCT.	0443	0038			?
007784283	ACT	L12	0025-4 PCT.	0826	0086			0
007784283	ACT	TF1	0005-3 PCT.	0806	0041			?
007784283	ACT	TF2	0025-4 PCT.	0833	0076			?

REPORT FXR33 LITTON BINNETICS MAGNETIC ACTIVITY SYSTEM
COMPUND SUMMARY BACKUP DRAFT

EXPERIMENT 500801		CONTRACT 22374-2104		SPECIES SPREAD		PROJECT 02468 DATE - 04/15/75		
ORG	TEST ID	CONCENTRATION	TEST ID	SPC1	SPC2	FREQUENCIES	FRFQ2	
DMM	90 UM/ML	0706	0039	0104	5.52	14.73	0	
A-C	SALINE	0654	0048	0118	7.34	18.04	0	
ACP	L1	0679	0067	0149	9.87	21.94	0	
ACP	L1	0631	0040	0105	6.34	16.64	0	
ACP	TF	0861	0014	0025	1.63	2.90	0	
007784283	ACT	0001-1 PCT.	0982	0037	0068	3.77	6.97	4
007784283	ACT	0005-2 PCT.	0648	0053	0113	8.18	17.44	2
007784283	ACT	0001-1 PCT.	0749	0027	0103	3.60	13.75	6
007784283	ACT	0005-2 PCT.	0733	0026	0111	3.55	15.14	0
007784283	ACT	0001-1 PCT.	0673	0039	0114	5.79	16.94	6
007784283	ACT	0005-2 PCT.	0514	0024	0100	4.67	19.46	6

REPORT FXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPONENT SUMMARY BACKUP DETAIL

EXPERIMENT	CONTRACT	DETECTOR	SPFCIES	RHEUS	DATE	PROJECT	DATE
000901	2374-2104	TA1535	MUT1	FRF01	04/15/75	FRF01	04/15/75
CMPD(UNI)	TEST ID	CONCENTRATION	FRP01	FP+0	CONTAM	CONTAM	CONTAM
A+C	DMM 50 UM/ML	0734	0046	6.27	0	0	0
A-C	SAL INF	1119	0035	3.13	2	2	2
ACP	L.I. DMM 50 UM/ML	0945	0497	52.59	3	3	3
ACP	L.I. DMM 50 UM/ML	0908	0051	5.67	0	0	0
ACP	TE DMM 50 UM/ML	0748	0048	6.42	2	2	2
007784283	ACT L.I. 0005-3 PCT.	1124	0037	3.29	2	2	2
007784283	ACT L.I. 0025-4 PCT.	0839	0033	3.93	2	2	2
007784283	ACT L.I. 0005-3 PCT.	0809	0036	4.45	2	2	2
007784283	ACT L.I. 0025-4 PCT.	1021	0041	4.02	2	2	2
007784283	ACT TF1 0005-3 PCT.	0906	0049	5.41	3	3	3
007784283	ACT TF2 0025-4 PCT.	1158	0035	3.07	0	0	0

REPORT EXR33 LITTON RIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPUND SUMMARY BACKUP DETAIL

EXPERIMENT 502201			CONTRACT 22374-2104 DETECTOR TA1537			SPECIES RHESUS			PROJECT 02468 DATE - 04/15/75	
ORG	TEST ID	CONCENTRATION	P0P01 EP+K	MUT1 EP+O	F0F01 FP-R	FRF01 FP-R	RHEBUS	RHEBUS	CONTAM	
A+C	AAF 800 ug/ml	0146	0017		11.64				0	
A-C	DMSON	0192	0001		0.52				0	
ACP	L1	AAF 800 ug/ml	0188	0018	9.57				0	
ACP	L10	AAF 800 ug/ml	0156	0008	5.13				2	
ACP	TE	AAF 800 ug/ml	0101	0009	8.91				0	
007784283	ACT	L11	0005-3 PCT.	0402	0004	1.00			0	
007784283	ACT	L12	0025-4 PCT.	0153	0007	4.58			0	
007784283	ACT	L11	0005-3 PCT.	0298	0008	2.68			0	
007784283	ACT	L112	0025-4 PCT.	0092	0008	8.70			0	
007784283	ACT	TF1	0005-3 PCT.	0232	0004	1.72			0	
007784283	ACT	TF2	0025-4 PCT.	0137	0004	2.92			0	

REPORT FXR33 LITTON RIONETICS MILITAGNIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104

DEFECTOR TA1538

SPFCIFS RHFSIS

PROJECT 02468
DATE - 04/15/75

EXPERIMENT	TEST	ORG	TEST ID	CONCENTRATION	PNP0	MIL1	PRFQ1	CONTAM
	A+C	AAF	800 IIG/ML	0936	0076	8.12	FP-R	0
	A-C	DMSO		1076	0071	6.60		?
	ACP	L.I	AAF 800 IIG/ML	0810	0195	24.07		3
	ACP	L.U	AAF 800 IIG/ML	1064	0111	10.43		0
	ACP	TE	AAF 800 IIG/ML	1263	0082	6.49		?
007784283	ACT	L.I	0005-3 PCT.	0725	0086	11.86		0
007784283	ACT	L.I2	0025-4 PCT.	0787	0087	11.05		0
007784283	ACT	L.II	0005-3 PCT.	0489	0092	18.81	(REMOVED)	0
007784283	ACT	L.II2	0025-4 PCT.	0705	0090	12.77		0
007784283	ACT	TF1	0005-3 PCT.	0592	0081	13.68		?
007784283	ACT	TF2	0025-4 PCT.	0921	0066	7.17		0

REPORT EXR33 LITTON BIOMEDICS MITAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

EXPERIMENT	CONTRACT	ID	SPECIES	PROJECT	DATE
505003	22374-2104	DETECTOR TA1538	RHFSSIS	02468	04/15/75
COMPOUND	ORG	TEST ID	CONCENTRATION	PNP11	MUT1
A-C	MSN		0.0570	EP+6	FP+0
007784283	ACT	0005-3 PCT.	0.0502	0.0018	0.04
				3.59	0

REPORT FXR33 LITTON RIONNETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

EXPERIMENT 502901			CONTRACT 22374-2104			PROJECT 02468			
COMPUND	TEST	ORG	CONCENTRATION	SPFCFS	RHFSS	DATE	FRFQ1	FRFQ2	
			DMN 90 UM/ML	FP+4	FP+1		FP-5	FP-5	
A+C			0529	0017	0260	3.21	49.15	4	
A-C		SALINF	0618	0032	0284	5.18	45.95	0	
ACP	L1	DMN 90 UM/ML	0341	0023	0272	6.74	79.77	0	
ACP	L0	DMN 90 UM/ML	0398	0004	0272	1.01	68.34	2	
ACP	TE	DMN 90 UM/ML	0505	0019	0214	3.76	42.38	0	
007784283	ACT	L11	0001-1 PCT.	0399	0013	0253	3.26	63.41	0
007784283	ACT	L12	0005-2 PCT.	0371	0017	0230	4.58	61.99	4
007784283	ACT	L01	0001-1 PCT.	0495	0013	0205	2.63	41.41	4
007784283	ACT	L02	0005-2 PCT.	0332	0022	0207	6.63	62.35	4
007784283	ACT	TF1	0001-1 PCT.	0477	0021	0273	4.40	57.23	4
007784283	ACT	TF2	0005-2 PCT.	0390	0020	0224	5.13	57.44	4